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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,593	01/29/2004	Edward Gustav Chron	ARC920030099US1	5209

29154 7590 01/08/2009
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EXAMINER

ZHANG, SHIRLEY X

ART UNIT	PAPER NUMBER
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2444

MAIL DATE	DELIVERY MODE
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01/08/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/767,593	Applicant(s) CHRON ET AL.	
	Examiner SHIRLEY X. ZHANG	Art Unit 2444	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-7,10-12,16-20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,10-12,16-20 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This final office action is prepared in response to the applicant's amendments and arguments filed on October 22, 2008 as a reply to the non-final office action mailed on July 22, 2008.

Claims 8-9, 14-15, 21, 23, 25 and 27 were previously cancelled;

Claims 3-4, 13, 24-26 and 28 are now cancelled;

Claims 1-2, 5-7, 10-12, 16-20 and 22 have been amended;

Claims 1-2, 5-7, 10-12, 16-20 and 22 are now pending;

Response to Arguments

Applicant's arguments and amendments filed on October 22, 2008 have been carefully considered but deemed unpersuasive in view of the following new grounds of rejection as explained herein below, necessitated by Applicant's substantial amendments to the claims which significantly affected the scope thereof, and will require further search and consideration.

Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

1. The objection to claim 1 regarding a typographical error is withdrawn in view of the amendments.
2. The rejections of claims 1 and 12 under 35 U.S.C. 112 1st and 2nd paragraphs are maintained because it is unclear what "said (a) maximum size supported by said (a) Network File System (NFS) protocol" is.

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First, neither the application disclosure nor the NFS protocol specification (RFC 1094) disclose or define a maximum size supported by NFS protocol.

Second, paragraph [0042] of the specification disclosed that the maximum request or response size for a conventional NFS protocol is smaller than the size of a jumbo packet, which contradicts the said claim element.

Claim Rejections - 35 USC § 112

The following is a quotation of the first and second paragraphs of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 1 and 12** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amended claims 1 and 12 recite “wherein a data size of said jumbo packet exceeds that of said maximum size supported by said NFS protocol.”

However, neither the application disclosure nor the NFS protocol specification (RFC 1094) disclose or define a maximum size supported by NFS protocol.

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4. **Claims 1 and 12** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in the scope.

The amended claims 1 and 12 recite “wherein a data size of said jumbo packet exceeds that of said maximum size supported by said NFS protocol.”

However, paragraph [0042] of the specification disclosed that the maximum request or response size for a conventional NFS protocol is smaller than the size of a jumbo packet, which contradicts the claim element, making it indefinite as to whether the size of a jumbo packet is bigger or smaller than the maximum size of NFS

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-2, 5-7, 10-12, 16-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Miloushev et al. (U.S. 2002/0120763, hereinafter “**Miloushev**”), in view of IETF RFC 1094 (“Network File System Protocol Specification”, version 2.0, hereinafter “**RFC 1094**”), and Parrella, et al. (U.S. 2003/0051055, hereinafter “**Parrella**”).

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As to claim 1, Miloushev disclosed a system of a communications network communicating between a plurality of client computers and a virtualized plurality of network attached store computers (Miloushev, Fig. 1) said system comprising:

An internal communications network (Miloushev, Fig. 1 and [0124], “connections 110 and 114”);

a plurality of communication virtualizers (Miloushev, Figs. 14-15 and [0103], “aggregation of file switches”) connected to said plurality of client computers via a plurality of external communication networks (Miloushev, Figs. 1, 14 and [0124], “client network 111”),

wherein a data size of said jumbo packet exceeds that of said maximum size supported by said NFS protocol (This claim limitation is always true when a maximum size supported by a NFS protocol is smaller than Ethernet’s maximum frame size, because it is well known in the art of TCP/IP that the size of an Ethernet packet equals the size of an NFS data payload plus the size of TCP header, IP header and Ethernet header combined);

a plurality of network-attached store computers connected to said plurality of communication virtualizers via said internal communications network and to an internal storage network of a plurality of storage devices (Miloushev, Figs. 14 shows multiple file servers 101-107 that is connected to the file switch 1403),

wherein said plurality of network-attached store computers are configured to appear as a single available network-attached store computer, corresponding to said virtualized plurality of network-attached store computers (Miloushev, [0087] and [0353], “a switched file system administered as a single file server”); and

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wherein a client computer sending a request to access storage, addresses said request to one of said plurality of communication virtualizers, said one of said plurality of communication virtualizers routing said request to one or more of said plurality of network-attached computers for storing (Miloushev, Figs. 1, 14 and [0121-0146]),

wherein said request is transmitted as a series of standard Ethernet packets, each packet comprising a portion of the request for storage, and said data size for said series of standard Ethernet packets exceeds that of said maximum size supported by said NFS protocol (Miloushev, Fig. 4 and [0141-0142] disclosed that the request for storage 205 are transmitted as a series of packets 201-204)

wherein said packets comprising a similar request for storage are linked together using a request identifier (RFC 1094, section 2.2 “Server Procedure” disclosed as an inherent feature of NFS protocol that the NFS server creates a file handle and sends it to the client when the client first opens the file. The client sends the handle back to the server when it requests operations on the file. In other words, the file handle is used as a request identifier) and a said packet sequence number (the IP header of a packet inherently contains a sequence number field that identifies a packet) and ,

wherein each request for storage comprises a unique request identifier that is shared among said packets comprising said similar request (as addressed above that a file handle carried by each NFS request is a request identifier); and

a plurality of external connection paths for facilitating direct communication between said network-attached store computers and said client computer (Miloushev, Figs. 14-15);

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wherein said plurality of virtualizers implement communications translation between said plurality of client computers accessing said plurality of network attached store computers, wherein said communications translation comprises any of:

translation from one network-attached store protocol to a different network-attached store protocol;

translation from a connection-oriented network attached store protocol to a packet-oriented network-attached store protocol; and

translation from a packet-oriented network-attached store protocol to a connection-oriented network-attached store protocol.

(Miloushev, [0354] disclosed that the switched file system provides a single namespace, which allows network file clients to use the standardized CIFS or NFS protocols while changes to the file servers and topologies can be performed transparently to all clients; this disclosure implies that the switched file system performs protocol translation between clients and file servers, i.e., the network attached store computers, especially when the system includes legacy servers as shown in Figs. 15 and 16) and

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Miloushev did not explicitly disclose wherein said communication virtualizer combines multiple Ethernet packets received from a client computer into a jumbo packet.

However, Parrella et al. disclosed a method for combining many small TCP/IP packets into one large IP packets (Parrella, [0060-0066]).

One of ordinary skill in the art would have been motivated to combine Miloushev and Parrella because both disclosed transmitting application data units between clients and servers via an intermediate node (Miloushev [0125], “file switch” and Parrella [0062], “Super User”).

Therefore, it would have been obvious for one skilled in the art to incorporate Parrella’s teaching into Miloushev’s file switch to have the file switch combine a plurality of NFS Ethernet packets into one jumbo Ethernet packet, so as to achieve the desirable result of optimally utilizing the available network bandwidth by reducing the overhead that would have been introduced otherwise by the control data in each small Ethernet packet.

As to claim 2, the combination of Miloushev and Parrella disclosed the communications network of claim 1.

Miloushev further disclosed an internal network of connection nodes connecting said plurality of communication virtualizers with said plurality of network-attached store computers (Miloushev, Figs. 14 and 15);

a computer system providing network attached store service according to a network file system protocol (Miloushev, [0343], “NFS protocol”);

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a plurality of communications network adapters by which said computer system connects to said internal communications network, and a plurality of storage network adapters by which said computer system connects to said internal storage network (Figs. 1, 14 and [0124]).

Claims 3-4 (cancelled)

As to claim 5, the combination of Miloushev and Parrella disclosed the communications network of claim 1.

Milousheve further disclosed that the system comprises an Ethernet networking hardware and medium access protocols for facilitating communication within said communication network (Miloushev, [0122] discloses that the file switch is preferably equipped with multiple high-speed network interfaces, such as gigabit or higher Ethernet interfaces).

As to claim 6, the combination of Miloushev and Parrella disclosed the communications network of claim 1.

Milousheve further disclosed that the system comprises a Transmission Control Protocol / Internet Protocol suite for facilitating communication between said plurality of network-attached store computers and said plurality of client computers (Miloushev, [0133] discloses that the file switch contains a TCP protocol stack).

As to claim 7, the combination of Miloushev and Parrella disclosed the communications network of claim 1.

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Milousheve further disclosed that the system comprises a storage access protocol for facilitating communication between a storage component within said communications network and remaining components within said communications network (Miloushev, [0123] discloses that the file switch preferably supports multiple industry standard network file protocols, such as NFS and CIFS).

Claims 8-9 (cancelled)

As to claim 10, the combination of Miloushev and Parrella disclosed the communications network of claim 1.

Milousheve further disclosed wherein each of said plurality of communication virtualizers comprises a network router (Miloushev, [0133] discloses that the typical operation of the file switch involves receiving file protocol requests, such as login, tree connect/mount, file open, file read/write, etc., from clients 112 and 113 and forwarding, or switching these requests to one or more of the file servers 101 through 107, therefore the file switch has the function of a network router).

As to claim 11, the combination of Miloushev and Parrella disclosed the communications network of claim 1.

Milousheve further disclosed that the system comprises a communication virtualizer file switch connected to a client computer and a server computer for sending requests from one of said plurality of client computers to a network-attached store and from said network-attached

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store computer back to said one of said plurality of client computers (Miloushev, Fig. 5 and [0133] disclosed that the file switch forwards client requests to the file servers; [0134] disclosed that the file switch sends responses from the server back to the client).

Claim 12 lists substantially the same elements as claim 1 in method form rather than system form. Therefore, the rationale for the rejection of claim 1 applies equally as well to claim 12.

As for the following claim element in claim 12 that is not explicitly listed in claim 1t “wherein said one of said communications virtualizers, upon receiving said request from said one of said plurality of client computers, transmits said request for storage to a chosen network-attached store computer based on a capability of said chosen network-attached store computer to properly process said request for storage”, Miloushev disclosed in paragraphs [0136-0146] methods for switching messages and transactions that read on the said claim element.

Claims 13-15 (cancelled)

As to claim 16, the combination of Miloushev and Parrella disclosed the communications network of claim 12.

Miloushev further disclosed wherein each of said plurality of network-attached store computers is configured for:

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receiving said request for storage from said one of said communication virtualizers (Miloushev, [0134] discloses that the TCP protocol stack on the server receives frames 201 through 204 as they arrive);

processing said request for storage (Miloushev, [0134] discloses that the server waits until it has received the whole message 205 and then interprets the contents of the header 200, and executes the required operation, in this case a file write, by writing the data payload to the proper file);

creating a corresponding response to said request for storage and sending said corresponding response to said communication virtualizer (Miloushev, [0134] discloses that upon completion, the server forms a response header 207 indicating the results of the requested operation).

packetizing said corresponding response (TCP/IP protocol stack inherently packetizes data);

sending said corresponding response to said one of said plurality of communication virtualizers (Miloushev, [0134] discloses that the TCP protocol stack forms a network frame 206 containing the header 207 and sends it to the client).

As to claim 17, the combination of Miloushev and Parrella disclosed the communications network of claim 16.

Miloushev further disclosed wherein each of said plurality of communication virtualizers is configured for receiving said corresponding response from said one of said network-attached store computers; determining a chosen client computer to which said corresponding response

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should be routed to; and routing said corresponding response to a chosen client computer (Miloushev, [0144-0145] discloses that the file switch receives responses from the file server, processes them and then sends them to the client).

As to claim 18, Miloushev the combination of Miloushev and Parrella disclosed the communications network of claim 17.

Miloushev further disclosed wherein said chosen client computer is configured for receiving said corresponding response from said on of said plurality of communication virtualizers (Miloushev, [0144] discloses that the switch then examines the transaction reply header 400 and determines how to modify that header so that the client on connection 109 would accept the modified result as a valid response to the original request 205, which implies that the client is configured for receiving responses from the file switch);

de-packetizing said corresponding response (it is inherent in TCP/IP stack); and routing said corresponding response to an initiating application (Miloushev, [0123] discloses that the file switch preferably supports multiple industry standard network file protocols, such as NFS and CIFS, which implies that there must be a NFS or CIFS application on the client to receive and process responses to the requests).

As to claim 19, the combination of Miloushev and Parrella disclosed the communications network of claim 15.

Miloushev further disclosed wherein said packets are categorized from a zeroth (0th) packet to an ith packet (Miloushev, [0123] discloses that the file switch preferably supports

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multiple industry standard network file protocols, such as NFS and CIFS, which inherent implies that the requests are sent using IP; RFC 791 discloses the fragmentation technique used by Internet Protocol (IP) for data payload that's bigger than what the physical layer medium can support)

As to claim 20, the combination of Miloushev and Parrella disclosed the communications network of claim 19.

Miloushev further disclosed wherein said one of said plurality of communication virtualizers determines which of said plurality of network-attached store computers to transmit said request for storage to by examining said zeroth packet in said request (Miloushev, [0137] discloses that upon receipt of the first frame 201, which contains the request header 200, the switch 100 recognizes that this frame signifies the beginning of a new message, examines the header 200 and decides to which of the file servers to forward the whole message).

Claim 21 (cancelled)

Claims 23-28 (Cancelled)

6. **Claim 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Miloushev, RFC 1094 and Parrella as applied to claim 12 above, further in view of IETF RFC 791, hereinafter "RFC 791".

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As to claim 22, the combination of Miloushev and Parrella disclosed the communications network of claim 21.

Miloushev further disclosed that said one of said plurality of network-attached store computers sends a standard Ethernet packet to said one of said plurality of communication virtualizers in reply to a client computer's request (Miloushev, [0122] discloses that the file switch is preferably equipped with multiple high-speed network interfaces, such as gigabit or higher Ethernet interfaces);

Miloushev did not explicitly disclose but it is inherent in RFC 791 that said communication virtualizer dividing said standard Ethernet packet into a plurality of standard Ethernet packets to send to said client computer as a response comprising multiple standard Ethernet packets (RFC 791, Section 2.3 "Function Description" discloses that IP employs the fragmentation technique that segments large packets into a series of smaller packets of a size that the underlying physical medium supports, as each type of physical media has its own Maximum Transmission Unit (MTU) requirement; In other words, if the communication virtualizer receives from the network attached store computer as a response a single packet of large size, e.g., a jumbo Gigabit Ethernet packet of 9000 bytes, the IP protocol built into the communication virtualizer will divide said large packet into a plurality of standard 1500-byte Ethernet packets that is acceptable to the regular 100Mbps Ethernet connecting the said virtualizer to client computers).

Conclusion

THIS ACTION IS FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHIRLEY X. ZHANG whose telephone number is (571)270-5012. The examiner can normally be reached on Monday through Friday 7:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shirley X. Zhang/
Examiner, Art Unit 2444
12/29/2008

/Paul H Kang/
Primary Examiner, Art Unit 2444